

Instructional Materials Evaluation Criteria – Intermediate Algebra

Title _____ **ISBN#** _____

Established Track Record? YES ☐ NO ☐

If yes, please list research source(s):

Meets National Mathematics Standards? YES ☐ NO ☐

Standard 1: Students will acquire number sense and perform operations with complex numbers and matrices.

Objectives	Indicators	Covered? Yes	Covered? No	Explanation of Coverage	Percentage of Coverage
Objective 1.1: Compute fluently and make reasonable estimates with complex numbers and matrices.	a. Simplify numerical expressions including those with rational exponents				
	b. Simplify expressions involving complex numbers.				
	c. Add, subtract, and multiply (including scalar multiplication) matrices using paper and pencil, computer programs, and calculators.				
	d. Find the multiplicative inverse of a matrix using paper and pencil for a 2 x 2 and computer programs and calculators for larger matrices.				
Objective 1.2: Extend the understanding of number systems to include the set of all complex numbers.	a. Know that $i^2 = -1$				
	b. Represent complex numbers graphically and in rectangular form.				
Objective 1.3: Identify relationships among matrices and operations involving matrices.	a. Identify matrices that can be added, subtracted, or multiplied.				
	b. Demonstrate that matrix multiplication is not				

	commutative, but the associative and distributive properties do hold for matrix multiplication.				
	c. Determine additive and multiplicative identities and inverses of a matrix when they exist.				
Standard 2: Students will represent and analyze mathematical situations and properties using patterns, relations, functions, and algebraic symbols.					
Objectives	Indicators	Covered? Yes	Covered? No	Explanation of Coverage	Percentage of Coverage
Objective 2.1: Use patterns, relations, and functions to represent mathematical situations.	a. Model real life relationships with functions.				
	b. Determine when a relation is a function.				
	c. Use function notation.				
	d. Know when two functions can be composed, and compose two functions				
	e. Add, subtract, and multiply and divide functions				
	f. Determine whether or not a function has an inverse				
	e. Find the inverse of a function.				
Objective 2.2: Solve quadratic equations and inequalities.	a. Solve quadratic equations of a single variable over the set of complex numbers by factoring, completing the square, graphically and using the quadratic formula.				

	b. Solve quadratic inequalities of a single variable.				
	c. Write a quadratic equation when given the solutions of the equation.				
	d. Solve quadratic equations that model real life situations.				
Objective 2.3: Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.	a. Solve and graph first-degree absolute value equations of a single variable.				
	b. Solve radical equations of a single variable including those with extraneous roots.				
	c. Solve absolute value and compound inequalities of a single variable.				
	d. Add, subtract, multiply, and divide rational expressions and solve rational equations.				
	e. Simplify algebraic expressions involving negative and rational exponents.				

Standard 3: Students will solve problems using spatial and logical reasoning, applications of geometric principles, and modeling.					
Objectives	Indicators	Covered? Yes	Covered ? No	Explanation of Coverage	Percentage of Coverage
Objective 3.1: Specify locations and describe spatial relationships using coordinate geometry.	a. Identify the domain and range of the absolute value, quadratic, radical, sine, and cosine functions.				
	b. Graph quadratic functions.				
	c. Graph absolute value functions.				

	d. Graph the solutions of absolute value and quadratic inequalities.				
	e. Graph square root functions.				
	f. Graph sine and cosine functions, including vertical translations and changes in amplitude and period.				
	g. Graph functions using transformations of parent functions.				
	h. Write an equation of a parabola in the form $y = a(x - h)^2 + k$ when given a graph.				
Objective 3.2: Solve systems of equations and inequalities.	a. Solve systems of linear, absolute value, and quadratic equations algebraically and graphically.				
	b. Graph the solutions of systems of linear, absolute value and quadratic inequalities				
	c. Solve application problems involving systems of equations and inequalities.				
	d. Use matrices to solve systems of linear equations with up to three variables.				

Standard 4: Students will understand and apply measurement tools, formulas, and techniques.					
Objectives	Indicators	Covered? Yes	Covered ? No	Explanation of Coverage	Percentage of Coverage
Objective 4.1: Understand radian and degree measure for angles.	a. Convert angle measurements between radians and degrees.				
	b. Use inverse trigonometric functions to find angle measures in degrees and radians, including				

	exact values for special angles.				
Objective 4.2: Determine trigonometric measurements using appropriate techniques, tools, and formulas.	a. Determine the exact values of the sine, cosine, and tangent functions for the special angles of the unit circle using reference angles				
	b. Find the length of an arc using radian measure.				
	c. Find the area of a sector in a circle using radian measure.				

Standard 5: Students will apply concepts and methods from probability and statistics to solve real problems.					
Objectives	Indicators	Covered? Yes	Covered ? No	Explanation of Coverage	Percentage of Coverage
Objective 5.1: Formulate research questions, and answer the questions by collecting, organizing, and analyzing data.	a. Compute the correlation for a set of bivariate data.				
	b. Design a simple comparative experiment to answer a question, determine treatments and identify methods of measuring variable.				
	c. Use randomization in survey and experiment design.				
	d. Organize, display, and summarize data using measures of central tendency and standard deviation.				
	e. Compare data sets with identical measures of central tendency but very different distributions.				

	f. Understand the difference between a sample and a census, and compare measures of central tendency for both.				
Objective 5.2: Apply basic concepts of probability.	a. Distinguish between permutations and combinations, and situations in which each is appropriate.				
	b. Calculate permutations and combinations of r objects drawn from n objects.				
	c. Calculate probabilities using permutations and combinations.				

Curriculum Coverage	3	2	1	0	N/A
Meets Core Standards and Objectives	80% of the state core objectives are covered. Objectives in instructional materials are clearly stated with measurable outcomes.	70% of the state core objectives are covered. Objectives in instructional materials are clearly stated with measurable outcomes.	50% of the state core objectives are covered.	Less than half of the state core objectives are covered.	
Content	Accurate information reflecting current mathematical knowledge. No content bias.	Some inaccuracies found, however information reflects current mathematical knowledge. No content bias.	Many inaccuracies were found on major mathematical concepts or content bias created problems with mathematical concepts.	Major inaccuracies found in mathematical content or concepts.	
Covers Process Skills	Materials support and encourage students to use mathematical process skills (i.e., problem solving, communication, reasoning and proof, connections, representation).	Materials provide a range of activities with set outcomes. Process skills are mentioned but not incorporated into instructional process.	Materials provide a set of explicit step-by-step instructions. Limited amount of process skills mentioned.	No hands-on activities. No process skills mentioned.	
Age Appropriate	A wide range of activities to accommodate various developmental levels at a reasonable pace and depth of coverage. Includes age appropriate cross-curricular references (e.g., literature, software, etc.) Content organized so prerequisite skills and knowledge are developed before more complex skills.	Some activities are adaptable to the appropriate age level. Some cross-curricular activities are given. Some attention given to prerequisite skills and knowledge.	Limited developmentally appropriate activities. Prerequisite skills and prior knowledge are not sufficiently developed before more complex concepts are introduced.	Age appropriate issues are not addressed. Several activities are not based on appropriate levels.	
Pedagogically Sound	Facilitates a wide range of teacher and student activities that reflect various learning styles and individual needs of students. Includes a wide variety of pedagogical strategies for flexible grouping and instruction.	Encourages and assists teachers in addressing learning styles and individual needs of students. Includes various pedagogical strategies for flexible grouping and instruction.	Addresses differences in learning and teaching to a limited degree. Includes some pedagogical strategies for flexible grouping and instruction.	Hinders effective pedagogy.	

Physical Qualities	3	2	1	0	N/A
Durability	Materials are securely bound and reinforced.	Materials are hardbound adequately.	Materials have secure binding.	Materials have inferior binding.	
Print Size and legibility for intended grade level	Appropriate use of font size and format for intended grade level.	Font size adequate for intended grade level.	Font size and format too small or too large for age group.	Font size inconsistent.	
	Key words or phrases bold faced and/or italicized.	Some key words or phrases boldfaced and/or italicized.	Highlighting was used too much, emphasized too much information.	No key words or phrases boldfaced or italicized.	
Pictures, tables, and graphics	Appropriate and varied pictures, tables, and graphs. Graphs and tables are correctly labeled (e.g., titles, keys, labels).	Limited pictures, tables, and graphs. Some tables and graphs are not labeled correctly.	Very limited pictures, tables, and graphs.	Inappropriate pictures, tables, and graphs.	
Includes table of content, glossaries, and index	Tables of contents, indices, glossaries, content summaries, and assessment guides are designed to help teachers, parents/guardians, and students. Clearly represents concepts within the text.	Tables of contents, indices, glossaries, content summaries, and assessment guides are designed to help teachers, parents/guardians, and students, are adequate but not clearly defined concepts within the text.	Simple tables of contents, indices, glossaries, content summaries, and assessment guides are included.	Is missing one or more of the following: simple table of contents, glossaries, content summaries, assessment guides, or indices.	
Ancillary Materials	3	2	1	0	N/A
Teacher Materials	Lesson plans are easy to understand and implement. Are clearly written and presented with accurate concepts.	Most lesson plans are easy to understand and implement. Are clearly written and presented with accurate concepts.	Lesson plans are difficult to understand.	No lesson plans.	
	Mathematical terms and academic vocabulary are appropriately used.	Generally mathematical terms and academic vocabulary are appropriately used.	Some mathematical terms and academic vocabulary are appropriately used.	There is a lack of mathematical terms and academic vocabulary.	
	Incorporates integration suggestions to other curriculum areas.	Most integration supports other curricular areas.	Some integration support for other curricular areas.	No integration support available.	
	Investigations and problem solving activities focus on demonstrating mathematical principles in the content area.	Most investigations and problem solving activities focus on demonstrating mathematical principles in the content area.	Limited investigations and problem solving activities focus on demonstrating mathematical principles in the content area.	Investigations and problem solving activities are not related to content area or no investigation activities.	

Ancillary Materials cont.	3	2	1	0	N/A
Student Materials	Activities engage students in purposeful mathematics.	Most activities engage students in purposeful mathematics.	Some activities engage students in purposeful mathematics.	Activities do not develop the concept studied.	
	Activities incorporate use of process skills (i.e., problem solving, communication, reasoning and proof, connections, representation) for deep understanding of mathematical principles.	Activities encourage the use of process skills for deep understanding of mathematical principles.	Activities mention the use of process skills for deep understanding of mathematical principals.	Activities do not encourage process skills for deep understanding of mathematics.	
	Includes ideas to extend concepts in real world applications.	Some ideas are included to extend concepts in real world applications.	Limited real world applications.	No real world applications suggested.	
Parent Materials	Homework assignments and activities support classroom learning and are written so that parents/guardians can help their children.	Suggested strategies and activities to assist parents/guardians.	Limited activities available for parent/guardian use.	No parent/guardians activities included.	
	ESL strategies and activities that support classroom learning are provided in materials sent home to parents.	Some ESL strategies and activities are provided in materials sent home to parents.	A few ESL strategies and activities that may be sent home to parents are provided.	No ESL strategies and activities are provided.	
Manipulatives	Manipulatives are provided and are appropriate.	Manipulatives are provided.	Manipulatives are not provided.	Manipulatives are not part of the program.	
	Manipulatives can be replaced economically and locally.	Manipulatives can be replaced locally or by mail order.	Needed manipulatives can be obtained locally or special ordered.		
Technology (teachers)	3	2	1	0	N/A
Ease of Use	Menus are easy to read and follow.	Menus are generally easy to read and follow.	Menus are easy to read. Might have to read manual to understand operation of technology. (e.g., laser remote, software.)	Menus are not very descriptive. Hard to follow.	
	User-friendly installation requires a minimal level of computer expertise.	Installation requires little computer expertise.	Installation requires some knowledge or expertise.	Installation requires expertise.	
	Manual and directions are understandable.	Manuals and directions are simple.	Manuals are included.	No manuals or written instructional materials are provided.	

Technology (teachers) cont.	3	2	1	0	N/A
Audio/Visual attributes	High quality audio and visuals are correct and contribute to overall effectiveness of program.	Audio and visuals are of good quality. Complements program effectiveness.	Audio and visuals are acceptable. Aligned with program content.	Audio and visual defects are apparent. Distracts from program content.	
	Information is current and up-to-date.	Information is current.	Information is mostly current.	Information is out-of-date.	
Enhances learning experience	Enhances learning experience. Adds depth and diversity.	Offers some additional depth and diversity to learning experience.	Mild impact to overall learning experience.	Does not impact learning experience.	
Technology (students)	3	2	1	0	N/A
Calculator	Appropriate activities and materials are provided to explore and prove conjectures.	Activities help students learn use to use calculator to explore concepts	Activities to learn to use calculators	No use of calculators or calculators used to check work only.	
Computer	Software allows students to explore and prove mathematical conjectures	Software allows students to explore math conjectures	Software demonstrates processes for mathematical applications	Drill and practice only	
Universal Access	3	2	1	0	N/A
Content accurately reflects diverse population	Provides ways to adapt curriculum for all students (e.g., special needs, learning difficulties, English language learners, advanced learners.)	Provides some ways to adapt curriculum to meet assessed special needs.	Provides limited strategies to assist special needs students.	Inappropriate strategies to assist special needs students.	
	Accurate portrayal of cultural, racial, and religious diversity in society.	Mostly accurate portrayal of cultural, racial, and religious diversity in society.	Does not address diversity in society.	Inaccurate portrayal of diverse populations and society.	
Assessment	3	2	1	0	N/A
Provides a variety of assessment options	Multiple measurements of individual student progress at regular intervals ensuring success of all students.	Assessment requires students to apply some concepts.	Assessment requires students to apply few concepts.	Provides only paper and pencil assessment.	

Assessment cont.	3	2	1	0	N/A
Assessment tools	Scoring tools and rubrics in assessment package.	Some scoring tools and rubrics provided.	Very few assessment tools are provided.	Answer keys to paper and pencil assessments.	
Assessment alignment to objectives	Assessment is provided to assess 80% of stated objectives with a variety of assessment strategies and items.	Assessment is provided to assess 70% of stated objectives.	Assessment is provided to assess 50% of stated objectives.	Assessment is provided to assess less than 50% of stated objectives.	
Assessment for understanding	Assessment requires the application of ideas and concepts.	Assessment requires the application of some ideas and concepts.	Assessment requires the application of few ideas and concepts.	No application of ideas and concepts.	